

SECTION 09360
MODULAR TACTILE SURFACES

PART 1 - GENERAL

0.1 DESCRIPTION OF WORK

- A.** Work Included: This Section specifies modular tactile surface sheet tile and filled pavers at station platforms.
- B.** Related Work: The following items are not included in this Section and will be performed under the designated Sections:
 - 1. Section 02513 - BITUMINOUS CONCRETE PAVEMENT: Paving adjacent to modular tiles.
 - 2. Section 03300 - CAST-IN-PLACE CONCRETE: Concrete substrate.
 - 3. Section 07920 - JOINT SELANTS: Sealants.
 - 4. Section 09300 - TILE: Tile adjacent to modular tiles.

0.2 SUBMITTALS

- A.** Shop Drawings: Include complete layout and fabrication details, composite structure, dimensions of tiled areas, and affected adjacent areas. Provide large scale plan details of the tiles at the curves, including fastener locations.
- B.** Product Data: Manufacturer's catalog cuts, material specifications, installation and maintenance instructions, and other data pertinent to the work of this Section.
- C.** Samples: One full-size sample of the type, size, pattern, and color of tile required, and five six by six inch samples for MBTA records.
- D.** Material Certification: Manufacturer's certification that all products meet specified requirements, as verified by a certified independent testing agency. Submit certified test reports for all tests shown in Article 2.02 B, indicating for each test whether or not the tile passes or fails the passing criteria. Test report shall be current and shall not predate the notice to proceed date of this contract by more than two years.
- E.** Installer Certification: Manufacturer's approval of installer if other than manufacturer, and detailed work history with the product proposed for installation.
- F.** Extra Materials: After completion of the work, furnish a minimum of ten percent of the total amount of tile furnished, from the same manufactured

lot as materials furnished for work of this Section, in sealed, protective packaging marked with Contract number, lot number and identification contents. Store in a location designated by the Engineer.

0.3 QUALITY ASSURANCE

- A.** Manufacturer: A company specializing in the manufacture of modular tactile surface tiles as used in transit systems for guidance of the sight impaired. Product must have been installed at other locations with successful records of performance and product durability.
- B.** Installer: Manufacturer-approved installer with documented experience in work similar to that of this Section. The Installer must be approved by the Engineer before installation of the tile may begin.
- C.** First Time Suppliers and Installers: For first time installers and suppliers of tactile tile to the MBTA, a meeting with representatives of the Engineer, Contractor, Surface Preparation subcontractor, Manufacturer, and Installer in attendance is mandatory. The agenda shall include the review and clarification of the specification, installation procedures, quality control, inspection and acceptance criteria and installation schedules. In no case will installation be allowed to commence until this meeting is held.
- D.** Hold Point - Mock-Up: After approval of materials, erect an eight foot long tile mock-up using specified materials, at a location acceptable to the Engineer.
 - 1. Assign the same construction crew to both the mock-up and the permanent work.
 - 2. If not approved, remove and replace mock-up at no additional cost to the Authority. Repeat procedure until approval is granted.
 - 3. Approved mock-up shall serve as the quality standard for appearance, tolerances, and workmanship.
 - 4. Approved mock-up may be incorporated in the permanent work, with the following certification.
 - 5. Protect and maintain approved mock-up in accepted condition throughout the construction period. When no longer required, remove and dispose of off site, if not incorporated into the permanent work.

0.4 DELIVERY, STORAGE AND HANDLING

- A.** Deliver materials and products in unopened, factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Store under cover and protect from all damage and pilferage

0.5 WARRANTY

- A. Warranty:** In addition to the requirements of the General Conditions, furnish a warranty jointly executed by the tile manufacturer and the installer. Warrant the work executed in this Section for a period of five years against failure of tile material, workmanship, and installation for the work performed under the supervision of the manufacturer of the tile. The Warranty shall include breakage, deformation, fading, chalking of finishes, loosening of tiles, and mechanical fasteners, which are used for securing the tiles to the platform.

PART 2 - PRODUCTS

0.1 MODULAR TACTILE SURFACE TILE

- A. Accessibility Requirements:** The modular tactile tile surface system shall differ from adjoining surfaces in resiliency or sound-on-cane contact as set forth by the latest requirements of the Americans with Disabilities (ADA) and the Massachusetts Architectural Access Board (AAB). Such reference is intended to establish quality and performance characteristics and meet the legal definition of the law.
- B. Modular Tile:** Provide fiberglass polymer platform edge surfaces with 24 in. x 48 in. sheets, as indicated on Drawings. Provide 1/8 in. minimum to 3/16 in. maximum thicknesses of the non-domed surface. The tactile tile shall be fabricated with a solid dome and solid body. Tile shall have a truncated dome design in patterns conforming to Americans with Disabilities Act Architectural Guidelines (ADAAG) requirements. Tiles shall have integral safety yellow color throughout the entire thickness of material.
1. **Modular Tactile Surface at Curb Ramps:** 24 inches wide, 1-1/2 inches thick polymer-concrete-filled fiberglass tile, maximum slope of 8 percent, in contrasting color with curb. Unit shall be flush with roadway and be able to withstand AASHTO H-20 truck loading.
- C. Performance Requirements:** Tiles shall be chemically test certified to resist corrosion by sand, salt, and salt substitutes and resist color change and be resistant to ultraviolet rays. Tiles shall exhibit the following properties, and be tested using the corresponding test method, and meet the respective passing criteria, as follows:
1. **Property: Water Absorption.**
 - a. **Test Method:** ASTM D570 - Standard Test Method for Water Absorption of Plastics.
 - b. **Passing Criteria:** No greater absorption than 0.35% of weight increase due to saturation.
 2. **Property: Compressive Strength.**

- a. Test Method: ASTM D 695 - Standard Test Method for Compressive Properties of Rigid Plastics.
 - b. Passing Criteria: 13000 psi average compressive strength.
3. Property: Slip Resistance.
 - a. Test Method: ASTM C1028 - Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.
 - b. Passing Criteria: Minimum coefficient of friction of 0.80 with Neolite under wet and dry conditions.
4. Property: Impact Resistance.
 - a. Test Method: ASTM D 5420 - Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling weight (Gardner Impact).
 - b. Passing Criteria: No cracks at ambient temperature.
5. Property: Accelerated Weathering.
 - a. Test Method: ASTM G 26 - Standard Practice for Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials.
 - b. Passing Criteria: No deterioration, fading, or chalking of tile surface after 500 hrs. of exposure.
6. Property: Fire Resistance.
 - a. Test Method: ASTM E 136 - Standard Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.
 - b. Passing Criteria: Material shall conform to the contained criteria to be considered noncombustible.
7. Property: Flexural Strength.
 - a. Test Method: ASTM D 790 - Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
 - b. Passing Criteria: 15,000 psi average flexural strength.
8. Property: Stain and Chemical Resistance.
 - a. Test Method: ASTM D 543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents.
 - b. Passing Criteria: No staining or dissolution of the material.

0.2 FASTENING SYSTEM

- A.** Fasteners: The fastener system shall consist of stainless steel masonry nails anchored into predrilled holes in the concrete platform sections, meeting the following requirements:

1. Nails: Supply stainless steel nails, oval head tamperproof, 1/8 inch diameter by 2 inches long. The head of the screw shall be powder coating finished to match the color of the tile or covered with a cap to match the tile finish. Nails shall be hammer driven into the concrete and shall be removable with the use of a special tool for the tamperproof head.

2. Number: The number of fasteners used shall be as required to completely fasten the tile to the platform substrate, but in no case will less than 10 fasteners be installed in a 2 foot by 4 foot modular unit. Fasteners shall not be installed in the body of the tactile material.
3. Adhesive: Urethane Adhesive as recommended by manufacturer of anchors, conforming to manufacture's installation instructions.

PART 3 - EXECUTION

0.1 INSPECTION OF SURFACES

- A. Carefully inspect substrates for conditions affecting application and performance of the work of this Section. Report defects in writing to Engineer. Do not proceed with tactile tile installation work until unsatisfactory conditions have been corrected.
- B. Beginning work shall constitute acceptance of its conditions and any defects in tactile tile installation work resulting from such accepted surfaces shall be corrected without further expense to the Authority.

0.2 PREPARATION

- A. Coordinate tile installation, working with prior and subsequent work of other trades.
- B. Ensure that concrete substrate is smooth, clean, cured and trowel finished or scarified, free from curing compounds or surface coatings. The tactile tile shall be installed on poured in place concrete, retractable edge units, or precast concrete units and not on leveling compounds or fillers.
- C. The platform surface shall be scarified or depressed during forming, except for 2 foot wide platform edge units, and preparation shall depend on the thickness of the modular tile/ The surface preparation shall also be as recommended by the manufacturer for installation of that particular product so the body of the tile is to be recessed flush with the finished platform surface so that only the domes project above the top of the finished surface.
- D. If applicable, any slurry or concrete dust produced by the scarifying procedure and/or drilling for mechanical anchors shall be vacuumed from the platform during the preparation process to prevent the slurry from cementing the ballast or fouling the track drains. This Contractor shall provide protection as required to prevent any residue from entering the ballast area.
- E. If applicable, electrical or signal cables under the platform edges or mounted on the support walls shall be protected, as required, using polyethylene or similar waterproof material.

0.3 INSTALLATION

- A.** Install tile in accordance with manufacturer's recommendations and as indicated on the Drawings. Install anchors and adhesive in accordance with manufacturer's recommendations.
- B.** Hold Point - The tiles shall be dry-fit and approved by the Engineer, prior to installation to ensure proper installation.
- C.** At the platform radius, tiles shall be installed with the platform edge tangent to the radius with the ends trimmed to provide a joint tangent to the curve and square to adjoining tiles. Domes cut in the trimming shall be beveled and polished to match the finish of the tile.
- D.** Apply sealant only at expansion joints in accordance with Section 07920 - JOINT SEALANTS.
- E.** Fasteners, as required by the platform conditions, shall be used to fully fasten the tile to the platform to provide complete contact between the tile and the platform.

0.4 PROTECTION

- A.** During construction and prior to opening the platform edge for public use, cover all tactile surfaces with an appropriate covering material, temporarily secured in place, to protect it from damage from construction activity. Remove covering when protection is no longer needed and dispose of it off-site in a manner conforming to all appropriate laws and regulations.
- B.** Prohibit construction vehicle traffic from riding on newly tiled surfaces. Do not place or store construction equipment or tools directly on tiled surfaces.
- C.** Provide snow removal as required using equipment that will not damage tile.

PART 4 - MEASUREMENT AND PAYMENT

0.1 MEASUREMENT

- A.** Modular tactile surfaces will be measured as per square foot complete in place, including all preparation, accessories and incidentals.

0.2 PAYMENT

- A. Payment for modular tactile surfaces will be made at the Contract unit price for the quantities as specified above.

0.3 PAYMENT ITEMS

ITEM NO.	DESCRIPTION	UNIT
0263.116	TACTILE WARNING STRIP	SF

END OF SECTION